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ORIGINAL ARTICLE

Nonuptake of HIV Testing Among Transgender Populations in the United States: Results from the 2015 U.S. Transgender Survey

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Abstract

Purpose: In this study, we examined the nonuptake of HIV testing and the main reasons for never testing among transgender populations.

Methods: Data on 26,927 respondents from the 2015 U.S. Transgender Survey were analyzed in this study. The main reasons for never testing were categorized as low risk perception; access related; fear or HIV-related stigma; and others. We performed weighted descriptive statistics and multivariable logistic regression analyses, controlling for sociodemographic characteristics and sexual orientation.

Results: Forty-five percent of the respondents had never tested for HIV. Trans women (adjusted odds ratio [aOR] = 1.1, 95% confidence interval [CI] = 1.07–1.25) and assigned female at birth genderqueer/nonbinary individuals (AFAB GQ/NB) (aOR = 1.3, 95% CI = 1.16–1.35) had significantly higher odds of reporting never testing for HIV compared with trans men. The most reported reason for never testing was low risk perception (87%). AFAB GQ/NB (aOR = 1.4, 95% CI = 1.22–1.66) had significantly higher odds of reporting low risk perception as the main reason for never testing for HIV relative to trans men. AFAB GQ/NB were less likely to report access related as the main reason for never testing (aOR = 0.8, 95% CI = 0.56–0.95). The odds of trans women and assigned male at birth GQ/NB individuals reporting fear or HIV-related stigma as the main reason for never testing were 1.7 (95% CI = 1.13–2.55) and 2.8 (95% CI = 1.69–4.70) times that of trans men. Both trans women (aOR = 0.8, 95% CI = 0.65–0.97) and AFAB GQ/NB (aOR = 0.7, 95% CI = 0.60–0.88) had lower odds of reporting others. The main reasons for never testing also varied by sociodemographic factors, including age, educational attainment, race/ethnicity, employment status, poverty, and sexual orientation.

Conclusions: HIV testing is suboptimal among transgender populations. Our findings also suggest that barriers to HIV testing vary by transgender populations, thus interventions for improved uptake should be population specific.

Keywords: barriers; gender minority; HIV/AIDS; screening

Introduction

HIV testing is of huge public health importance as it enables detection of HIV and enrollment into care for improved health outcome and reduced risk of transmission.[1] In the United States, the Centers for Disease Control and Prevention (CDC) has continued to advocate for routine HIV testing in the general population and those at increased risk of HIV infection. As far back as 2006, the CDC recommended HIV testing at least once as part of routine medical care for persons between 13 and 64 years old and at least once in a year for those most at risk of HIV such as men who have sex with men (MSM) and people who inject drugs (PWID).[2] In 2013, routine screening of adults and adolescents (15–65 years) was endorsed by the U. S. Preventive Services Task Force,[3] which was reaffirmed in 2019.[4] Despite these recommendations, although increasing, HIV testing in the United States is suboptimal.[5,6]

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Consequently, of the 1.1 million people estimated to be living with HIV in the United States, 14.2% are unaware of their HIV status.[7]

Compared with the general population, transgender populations (persons whose gender identity or expression is different from their sex assigned at birth) are at increased risk of HIV infection.[8–10] Factors such as stigma, high rates of incarceration, intimate partner violence, substance use, high-risk sexual behaviors, mental health issues, and economic marginalization increase their vulnerability to HIV.[11–15] In the United States, a pooled analysis of studies published between January 2006 through 2017 estimated the prevalence of HIV among transgender populations as 9.2%.[16] Among these gender minorities, studies have shown that trans women are disproportionately affected by HIV.[14,16,17] However, in some settings, prevalence of HIV has been found to be comparable between trans women and trans men.[18] Despite their higher vulnerability to HIV, there are no CDC guidelines specific for the transgender community, while evidence suggests low uptake of HIV testing among them. The 2014 and 2015 Behavioral Risk Factor Surveillance System (BRFSS) conducted in 28 jurisdictions showed that nearly two-thirds of trans women and trans men reported never testing for HIV.[19] However, genderqueer/nonbinary (GQ/NB) persons were not considered in the study.

Generally, multiple barriers at individual and structural levels affect the uptake of HIV testing in the United States.[20–25] Recent studies on reasons for never testing for HIV among the general population[26] and non-Hispanic Black men[27] reported low risk perception as the most commonly cited reason. Among Latino/Hispanic MSM, a study reported fear of HIV positivity as the most common reason cited by test avoiders (people who had never tested or their most recent HIV test was >5 years).[28] However, these reasons and how they vary among transgender populations have been limitedly investigated in the United States. Accordingly, we examined the nonuptake of HIV testing and main reasons for never testing for HIV in transgender populations and how they vary by gender identities in the United States.

Methods

Data source

Data from the 2015 U.S. Transgender Survey (USTS) were analyzed in this study. The 2015 USTS was an anonymous, nonprobability, national online survey conducted among transgender populations (18 years and older) across the 50 states, the District of Columbia, American Samoa, Guam, Puerto Rico, and U.S. military bases overseas. The survey was conducted by the National Center for Transgender Equality. A detailed description of the survey design and procedure can be found elsewhere.[10]

Study sample

The 2015 USTS had a total of 27,715 respondents.[10] The categories of the respondents in the survey included (1) trans women (individuals assigned male at birth who identify as female); (2) trans men (individuals assigned female at birth who identify as male)[10]; (3) assigned female at birth (AFAB) or assigned male at birth (AMAB) GQ/NB (individuals whose gender is not exclusively male or female, including those who identify as having no gender, a gender other than male or female, or more than one gender)[10]; and (4) cross-dressers (individuals who dress in a way that is typically associated with a gender different from the one assigned at birth).[10] We restricted our analysis to respondents in the U.S. states and territories and excluded respondents from the U.S. military bases (0.1%) overseas because of their different context from the rest of the respondents. We also excluded cross-dressers (3%) because they exhibit a different HIV profile. A total of 26,927 transgender individuals were included in the analysis.

Measures

In the survey, respondents were asked whether they had ever been tested for HIV, aside from testing obtained through the blood donation process. Those who answered no to the question were asked the main reason why they had not been tested for HIV. The responses were (1) unlikely to be exposed to HIV, (2) the doctor/health care provider never mentioned getting an HIV test, (3) did not know where to get tested, (4) did not want to think about HIV or being HIV positive, (5) afraid to find out if HIV positive, (6) worried name would be sent to the government if tested positive, (7) afraid of losing their job, insurance, home, friends, or family if people knew they were tested, (8) did not like needles, (9) some other reason, and (10) no particular reason. We adapted the classification by a previous study[27] and categorized these reasons into four groups: 1 as low risk perception; 2 and 3 as access related; 4–7 as fear or HIV-related stigma; and 8–10 as others.

Data analyses

Weighted descriptive statistics were conducted to summarize the data. Weighted multivariable logistic regression analyses were performed to examine the differences in the prevalence of and main reasons for never testing for HIV between trans women, trans men, and GQ/NB persons. We controlled for the following covariates, which have been found to influence testing for HIV[24,27,29–31]: age (respondents' age in years at the time of the survey: 18–24, 25–34, 35–44, 45–54, or ≥55); educational attainment (the highest level of education or degree completed: less than high school, high school graduate, some college (no degree) or associate's degree, or bachelor's degree or higher); marital status (legal status with respect to marriage: married, formerly married, or never married); race/ethnicity (categories that most accurately described respondents' racial or ethnic identity: White, Black or African American, Latino(a) or Hispanic, or multiracial and others); employment status (current employment status: employed, unemployed, or out of the labor force); poverty (total family income at or below 124% of the official poverty line: yes or no); and sexual orientation (respondents' identity in relation to the persons to which they have sexual attraction: lesbian, gay, or bisexual; heterosexual; or asexual).

For the main reasons for never testing for HIV, four separate multivariable logistic regression models were fitted. For each of the models, a binary dependent variable was created, with one category of the reasons for never testing coded as 1, while the remaining categories coded as 0. We reported the adjusted odds ratios (aORs) with their 95% confidence intervals (CIs). All analyses were considered statistically significant at $p < 0.05$. The data analysis was performed with SPSS, version 26. This study was a secondary analysis of deidentified data and was granted an exemption by the Institutional Review Board of the University of Nevada, Las Vegas.

Table 1. Characteristics of the Study Sample, 2015 U.S. Transgender Survey (*N* = 26,927)

Characteristics	*N* (unweighted)	% (Weighted)
Gender		
Trans men	7939	30.2
Trans women	9230	34.3
AFAB GQ/NB	7836	28.5
AMAB GQ/NB	1922	7.1
Age (in years)		
18–24	11,766	42.7
25–34	7872	30.9
35–44	2906	11.4
45–54	2090	7.5
≥55	2293	7.5
Educational attainment		
Less than high school	890	2.5
High school graduate[a]	3379	10.6
Some college (no degree) or Associate's degree	12,529	49.6
Bachelor's degree or higher	10,129	37.3
Marital status		
Married	4552	16.0
Formerly married[b]	3050	10.4
Never married	19,261	74.3
Missing	64	0.3
Race/ethnicity		
White	21,959	61.9
Black or African American	778	12.7
Latino(a) or Hispanic	1451	16.8
Multiracial and others	2739	8.7
Employment status		
Employed	17,432	66.2
Unemployed	3558	13.1
Out of the labor force	5801	20.1
Missing	136	0.6
Poverty		
No	16,984	61.8
Yes	8557	33.3
Missing/unclassified	1386	4.8
Sexual orientation		
LGB	19,119	69.5
Heterosexual	3039	14.1
Asexual	2947	10.1
Missing	1822	6.3

[a]Including GED.
[b]Widowed, divorced, or separated.
AFAB, assigned female at birth; AMAB, assigned male at birth; GED, General Educational Development; GQ/NB, genderqueer/nonbinary; LGB, lesbian, gay, and bisexual.

Results

The characteristics of the respondents included in the study are shown in Table 1. Approximately 30% identified as trans men, 34% as trans women, and 28% as AFAB GQ/NB. AMAB GQ/NB accounted for less than 7% of the respondents. Nearly 43% of the respondents were between 18 and 24 years old and 37% had at least a bachelor's degree. Over 60% of the respondents were White, employed, had never married, lived above the poverty line, and identified as lesbian, gay, or bisexual.

Forty-five percent indicated that they had never tested for HIV (Table 2). There were significant differences in HIV testing by sociodemographic characteristics and sexual orientation (Table 2). The percentage that had never tested for HIV was highest among transgender populations who were AFAB GQ/NB, 18–24 years old, had less than high school education, never married, White, unemployed, living above the poverty line, and asexual (Table 2). After adjusting for sociodemographic characteristics and sexual orientation, the

Table 2. HIV Testing Among the Study Sample, 2015 U.S. Transgender Survey

Characteristics	Ever tested		Never tested		p^a
	N (weighted)	% (Weighted)	*N* (weighted)	% (Weighted)	
Gender (*N* = 26,800)					
Trans men	4195	57.8	3728	42.2	< 0.001
Trans women	5485	62.4	3738	37.6	
AFAB GQ/NB	3140	42.6	4680	57.4	
AMAB GQ/NB	1029	56.4	885	43.6	
Age (in years) (*N* = 26,880)					
18–24	3382	32.6	8352	67.4	< 0.001
25–34	5072	67.6	2790	32.4	
35–44	2265	80.5	639	19.5	
45–54	1585	77.6	504	22.4	
≥ 55	1545	68.4	746	31.6	
Educational attainment (*N* = 26,880)					< 0.001
Less than high school	236	40.3	651	59.7	
High school graduate	1097	41.3	2272	58.7	
Some college (no degree) or Associate's degree	5753	48.2	6748	51.8	
Bachelor's degree or higher	6763	68.9	3360	31.1	
Marital status (*N* = 26,816)					< 0.001
Married	3060	69.0	1488	31.0	
Formerly married	2337	78.2	711	21.8	
Never married	8421	48.6	10,799	51.4	
Race/ethnicity (*N* = 26,880)					< 0.001
White	11,064	52.2	10,857	47.8	
Black or African American	535	69.7	240	30.3	
Latino(a) or Hispanic	763	54.8	687	45.2	
Multiracial and others	1487	53.6	1247	46.4	
Employment status (*N* = 26,747)					< 0.001
Employed	9895	59.5	7518	40.5	
Unemployed	1357	44.4	2189	55.6	
Out of the labor force	2527	46.6	3261	53.4	
Poverty (*N* = 25,518)					< 0.001
No	9499	60.3	7474	39.7	
Yes	3922	47.8	4623	52.2	
Sexual orientation (*N* = 25,068)					< 0.001
LGB	10,518	57.9	8574	42.1	
Heterosexual	1831	66.0	1204	34.0	
Asexual	713	25.9	2228	74.1	
All (*N* = 26,880)	13,849	55.0	13,031	45.0	

[a]Chi-square test.

odds of trans women and AFAB GQ/NB and AMAB GQ/NB reporting never testing for HIV were 1.2 and 1.3 times that of trans men, respectively (Table 3). There was no significant difference between AMAB GQ/NB and trans men.

The main reasons for never testing are shown in Table 4. The most common reason for never testing for HIV was low risk perception (86.6%). Others was cited by 8.2%, while access related and fear or HIV-related stigma were cited by 3.5% and 1.7%, respectively. The main reasons for never testing by gender identity are shown in Figure 1. The percentage who reported low risk perception was highest among AFAB GQ/NB, while access related was highest among trans men, fear or HIV-related stigma was highest among AMAB GQ/NB and others among trans men.

The results of the multivariable logistic regression analyses of the main reasons for never testing for HIV are presented in Table 5. After adjusting for sociodemographic characteristics and sexual orientation, compared with trans men, AFAB GQ/NB (aOR = 1.4, 95% CI = 1.22–1.66) had significantly higher odds of reporting low risk perception as the main reason for never testing for HIV. However, AFAB GQ/NB had significantly lower odds of reporting access-related issues (aOR = 0.8, 95% CI = 0.56–0.95). The odds of trans women and AMAB GQ/NB reporting fear or HIV-related stigma were 1.7 (95% CI = 1.13–2.55) and 2.8 (95% CI = 1.69–4.70) times that of trans men. Both trans women (aOR = 0.8, 95% CI = 0.65–0.97) and AFAB GQ/NB (aOR = 0.7, 95% CI = 0.60–0.88) had lower odds of reporting others.

Table 3. Multivariable Logistic Regression Analysis of Factors Associated with Never Testing for HIV, 2015 U.S. Transgender Survey (*N* = 23,652)

Characteristics	aOR (95% CI)
Gender	
Trans men	1
Trans women	1.1 (1.07–1.25)***
AFAB GQ/NB	1.3 (1.16–1.35)***
AMAB GQ/NB	1.0 (0.83–1.09)
Age (in years)	
18–24	1
25–34	0.3 (0.29–0.33)***
35–44	0.2 (0.15–0.19)***
45–54	0.2 (0.17–0.23)***
≥55	0.3 (0.26–0.34)***
Educational attainment	
Less than high school	1
High school graduate	0.9 (0.77–1.16)
Some college (no degree) or Associate's degree	0.7 (0.58–0.85)***
Bachelor's degree or higher	0.5 (0.40–0.59)***
Marital status	
Married	1
Formerly married	0.6 (0.53–0.68)***
Never married	1.0 (0.96–1.15)
Race/ethnicity	
White	1
Black or African American	0.4 (0.36–0.44)***
Latino(a) or Hispanic	0.7 (0.65–0.77)***
Multiracial and others	0.8 (0.68–0.85)***
Employment status	
Employed	1
Unemployed	1.2 (1.09–1.30)***
Out of the labor force	1.3 (1.16–1.35)***
Poverty	
No	1
Yes	0.9 (0.86–0.98)**
Sexual orientation	
LGB	1
Heterosexual	1.1 (1.00–1.19)
Asexual	3.0 (2.70–3.32)***

Unweighted cases included in the model; $^{**}p < 0.01$ and $^{***}p < 0.001$. The model correctly classified 70.5% of cases.
aOR, adjusted odds ratio; CI, confidence interval.

Table 4. Main Reasons for Never Testing for HIV, 2015 U.S. Transgender Survey (*N* = 13,018)

Reason	*N* (unweighted)	% (Weighted)
Low risk perception	11,491	86.6
1. Unlikely to be exposed to HIV	11,491	86.6
Access related	387	3.5
2. Doctor/health care provider never mentioned getting an HIV test	266	2.5
3. Did not know where to get tested	121	1.0
Fear or HIV-related stigma	179	1.7
4. Did not want to think about HIV or being HIV positive	81	0.8
5. Afraid to find out if HIV positive	77	0.7
6. Worried name would be sent to the government if tested positive	10	0.1
7. Afraid of losing their job, insurance, home, friends, or family if people knew they were tested	11	0.1
Others	961	8.2
8. Did not like needles	99	0.8
9. Some other reason	196	1.5
10. No particular reason	666	5.9

The main reasons for never testing also varied by sociodemographic factors, including age, educational attainment, race/ethnicity, employment status, poverty, and sexual orientation (Table 5). Race/ethnicity was significant across the four main reasons. In comparison with White transgender individuals, Black or African American (aOR = 0.4, 95% CI = 0.35–0.51), Latino(a) or Hispanic (aOR = 0.6, 95% CI = 0.51–0.68), and multiracial and others (aOR = 0.6, 95% CI = 0.51–0.75) had lower odds of reporting low risk perception. However, being Black or African American (aOR = 2.3, 95% CI = 1.72–3.21), Latino(a) or Hispanic (aOR = 1.6, 95% CI = 1.21–2.08), or multiracial and others (aOR = 1.6, 95% CI = 1.21–2.08) was associated with greater odds of reporting access-related barriers. The odds of reporting fear or HIV-related stigma among Black or African American transgender persons was nearly five times that of White transgender individuals (aOR = 4.6, 95% CI = 3.09–6.71). Black or African American (aOR = 1.6, 95% CI = 1.27–2.08), Latino(a) or Hispanic (aOR = 1.7, 95% CI = 1.43–2.07), and multiracial and others (aOR = 1.5, 95% CI = 1.20–1.97) had higher odds of reporting others.

Discussion

HIV testing among key populations such as transgender individuals is important to end the HIV epidemic as this can facilitate access to prevention and treatment. In this study, we assessed the nonuptake of HIV testing and main reasons for never testing for HIV in transgender populations (trans men, trans women, AFAB GQ/NB, and AMAB GQ/NB) in the United States. Despite their vulnerability, we found that nearly half of them (45%) had never tested for HIV. Our results showed that never testing for HIV varies with gender identity, with AFAB GQ/NB having higher odds of never testing relative to trans men. Although lower, our finding is consistent with a recent study that also found suboptimal testing among transgender populations in the United States. Using BRFSS data from 2014 and 2015, Pitasi et al. reported that 64.4% of trans women and 68.4% of trans men had never tested for HIV, after adjusting for demographic characteristics.[19] Among transgender youth, Sharma et al. also reported that trans women were significantly less likely to report testing for HIV compared with trans men.[32]

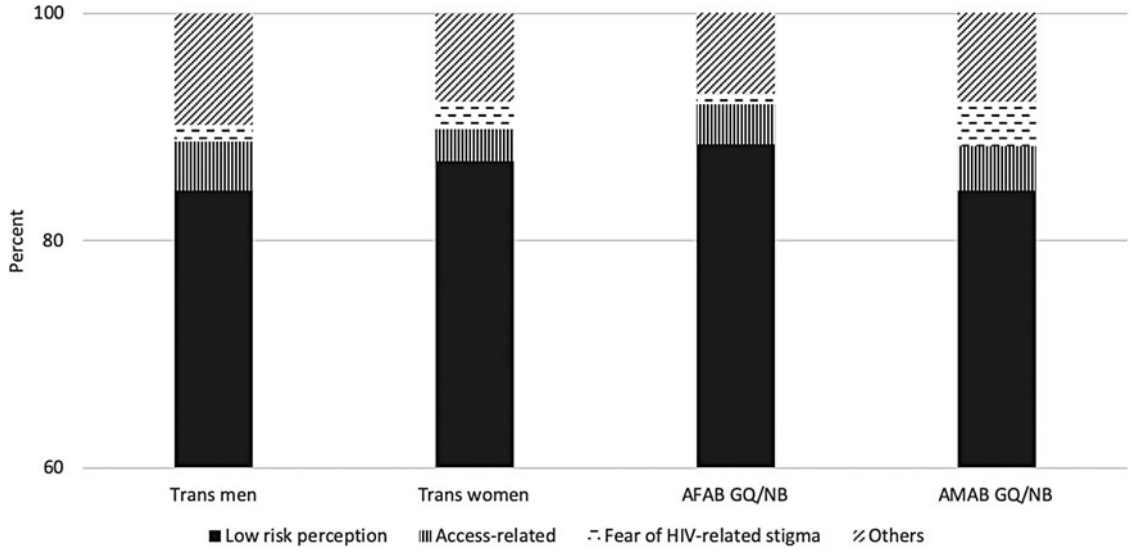

FIG. 1. Main reasons for never testing for HIV by gender identity, 2015 U.S. Transgender Survey.

The majority of respondents who had never tested for HIV cited low risk perception as the main reason, which is in line with previous qualitative and quantitative studies that have reported low risk perception as one of the major factors limiting uptake of HIV testing in the United States.[24–27,33–36] Like any other diseases, HIV risk perception can be influenced by a number of factors, including information, personal experience, and affective factors.[37] Compared with trans men, AFAB GQ/NB have been reported to have a lower burden of HIV, while trans women have a higher burden.[10] This may explain why risk perception was higher among AFAB GQ/NB. Regardless of the self-perceived risk, studies have reported no significant differences in risky behaviors such as condomless sex, sex under the influence, and alcohol use among trans men, trans women, and GQ/NB persons.[38,39] Those with low risk perception may actually be at risk of HIV[40–42] and may have never tested for HIV.[43]

Health care providers' awareness of their clients' sexual orientation or gender identity may influence their recommendation for health services, such as HIV testing.[44,45] However, because of fear of discrimination,[46] disclosure to the health care provider is suboptimal among transgender populations.[10] This may account for the lack of provider-initiated HIV testing for transgender populations observed in this study. Provider-level barriers, such as lack of knowledge,[22,47] time constraints,[47,48] and disagreement with the CDC recommendations,[22] also limit routine HIV testing services. Compared with trans men, AFAB GQ/NB are less likely to be "out" to health care providers on their gender identity,[49] but interestingly, we found that they were less likely to report access-related barriers, particularly "Doctor/health care provider never mentioned getting an HIV test" (after further disaggregation to examine the association). Higher denial of care experienced by trans men may be one of the possible explanations for this finding.[50] The reasons for this disparity in offering HIV testing to transgender populations will need to be explored in future studies. Not knowing where to get tested also appeared as a barrier among some respondents. In addition to health care facilities, HIV testing can be done in nonclinical settings, with HIV test kits also available for home use.[51,52] Creating awareness about the different means to get an HIV test among the transgender community may mitigate against such barrier, affecting uptake of HIV testing.

Although HIV stigma has reduced in the United States,[53] it still persists as a structural barrier to HIV testing.[54,55] The expectation of experiencing HIV stigma at an interpersonal or organizational level after testing positive has been found to be associated with delay in HIV testing among high-risk populations in the United States.[56] Stressors from discrimination experienced by transgender populations as a result of their gender identity or expression may be compounded by a stigmatized disease such as HIV[57–59] and this may prevent them

Table 5. Multivariable Logistic Regression Analyses of Factors Associated with Main Reasons for Never Testing for HIV, 2015 U.S. Transgender Survey ($N = 11,066$)

	Low risk perception[a]	Access related[b]	Fear or HIV-related stigma[c]	Others[d]
Characteristics	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)	aOR (95% CI)
Gender				
Trans men	1	1	1	1
Trans women	1.2 (1.00–1.36)	0.8 (0.58–1.04)	1.7 (1.13–2.55)*	0.8 (0.65–0.97)*
AFAB GQ/NB	1.4 (1.22–1.66)***	0.8 (0.56–0.95)*	0.7 (0.45–1.15)	0.7 (0.60–0.88)**
AMAB GQ/NB	0.9 (0.72–1.18)	1.1 (0.75–1.74)	2.8 (1.69–4.70)***	0.7 (0.53–1.05)
Age (in years)				
18–24	1	1	1	1
25–34	1.1 (0.92–1.29)	0.6 (0.46–0.88)**	1.2 (0.80–1.77)	1.0 (0.83–1.26)
35–44	0.7 (0.56–1.00)	0.9 (0.53–1.72)	1.1 (0.51–2.26)	1.6 (1.12–2.26)*
45–54	0.7 (0.50–0.99)*	0.8 (0.39–1.78)	1.6 (0.73–3.45)	1.6 (1.06–2.36)*
55 and above	1.3 (0.86–1.83)	0.8 (0.36–1.68)	0.8 (0.30–1.98)	0.9 (0.55–1.37)
Educational attainment				
Less than high school	1	1	1	1
High school graduate	0.8 (0.59–1.16)	1.8 (0.93–3.52)	1.4 (0.47–3.91)	1.0 (0.65–1.43)
Some college (no degree) or Associate's degree	1.2 (0.86–1.61)	1.2 (0.62–2.23)	1.4 (0.53–3.89)	0.7 (0.48–1.00)*
Bachelor's degree or higher	1.7 (1.18–2.33)**	0.9 (0.45–1.78)	1.2 (0.42–3.38)	0.5 (0.32–0.72)***
Marital status				
Married	1	1	1	1
Formerly married	0.9 (0.66–1.26)	1.1 (0.56–2.32)	0.8 (0.33–1.79)	1.2 (0.80–1.69)
Never married	1.1 (0.88–1.38)	1.2 (0.74–1.95)	1.0 (0.56–1.70)	0.8 (0.63–1.09)
Race/ethnicity				
White	1	1	1	1
Black or African American	0.4 (0.35–0.51)***	2.3 (1.72–3.21)***	4.6 (3.09–6.71)***	1.6 (1.27–2.08)***
Latino(a) or Hispanic	0.6 (0.51–0.68)***	1.6 (1.21–2.08)**	1.2 (0.79–1.94)	1.7 (1.43–2.07)***
Multiracial and others	0.6 (0.51–0.75)***	1.7 (1.18–2.36)**	1.4 (0.79–2.44)	1.5 (1.20–1.97)**
Employment status				
Employed	1	1	1	1
Unemployed	1.2 (0.99–1.38)	0.8 (0.58–1.05)	1.1 (0.73–1.68)	0.9 (0.70–1.08)
Out of the labor force	1.2 (0.99–1.34)	0.7 (0.55–0.95)*	0.9 (0.51–1.19)	1.0 (0.83–1.19)
Poverty				
No	1	1	1	1
Yes	0.7 (0.62–0.79)***	1.5 (1.23–1.90)***	1.0 (0.75–1.45)	1.3 (1.19–1.63)**
Sexual orientation				
LGB	1	1	1	1
Heterosexual	1.0 (0.82–1.19)	0.7 (0.47–1.01)	1.0 (0.60–1.52)	1.2 (0.95–1.48)*
Asexual	1.2 (1.02–1.44)*	0.8 (0.61–1.11)	0.5 (0.39–0.90)*	0.9 (0.74–1.13)

Unweighted cases included in the model; $^{**}p < 0.05$; $^{**}p < 0.01$; and $^{***}p < 0.001$.
[a]The model correctly classified 86.7% of cases.
[b]The model correctly classified 96.3% of cases.
[c]The model correctly classified 98.3% of cases.
[d]The model correctly classified 92.1% of cases.

from testing, particularly trans women and AMAB GQ/NB who are more likely to be living with HIV compared with trans men.[10] While transgender populations commonly experience discrimination, there is evidence to suggest that discrimination varies by gender identity.[10] Using the National Transgender Discrimination Survey to evaluate the employment outcomes, a study reported that transgender women have worse employment experiences than nonbinary transgender people and transgender men and AMAB GQ/NB tended to be discriminated against in hiring compared with AFAB GQ/NB.[60]

Some of the respondents indicated that there was no particular reason they had never tested for HIV. This has been reported as the most common reason for not testing for HIV in the last 12 months among PWID[61,62] and heterosexual persons at risk of HIV.[61] While no particular reasons for never testing for HIV may be difficult to explain, education about the importance of testing or offering HIV testing to such people may increase their uptake of HIV testing. Phobia for needles among some adults affects the uptake of medical care or procedures,[63] and for those who reported it as the main reason for never testing for HIV,

it can be managed by psychological and physical interventions, depending on the severity.[64] The oral fluid-based test can be used for those who are scared of needles[65] and it has been found to be acceptable and feasible among transgender women and their sexual partners in the United States.[66–68]

Beyond the differences in gender identities, our findings also indicate important sociodemographic disparities in the reasons for never testing for HIV. For example, risk perception among transgender populations varied significantly by race/ethnicity and income as people of color and those living at or below 124% of the poverty level were less likely to report low risk perception as the main reason for never testing. This supports the role that the burden of HIV may play in risk perception as these categories of transgender populations are at increased risk of HIV or more likely to be residing in areas with high HIV burden.[17,69,70] However, our results showed that they were more likely to have access-related barriers to HIV testing. These barriers may be contributing to the lower uptake of HIV testing among these transgender populations. Furthermore, Black transgender populations were more likely to report fear or HIV-related stigma as the main reason for never testing, perhaps to avoid intersection of multiple stigmatized identities, including race, gender identity, and an HIV-positive status, which can worsen health outcomes.[71,72]

This study has some limitations. It was a cross-sectional study, and causation could not be established. HIV testing in the survey was self-reported and there might have been some inaccurate reports from social desirability or recall bias. Although the 2015 USTS has been the largest survey of transgender people in the United States, the respondents were not randomly selected, and findings may not be representative to all transgender people. The reasons for not testing were largely closed ended and may have limited respondents' choices. The survey did not include any question about HIV risk behaviors (e.g., sexual behaviors), so we could not assess whether or not those who reported low risk perception were engaging in low risk HIV behaviors. We recommend that future quantitative studies should consider this and how it varies by gender identity.

Conclusions

Despite the importance of HIV testing in preventing and managing HIV infection in high-risk populations, nearly half of the transgender populations in the study reported never having an HIV test, largely because of low risk perception. Our findings also indicated that the transgender populations are not a monolith with regard to barriers to HIV testing, thus interventions should be population specific. Overall, to close the gap in HIV diagnosis among transgender populations, there is a need for increased health education and sensitization on the significance of HIV testing. This may involve the use of technology and social media, which have been shown to be effective in promoting and facilitating HIV testing among transgender populations. Health care providers should offer HIV testing to all transgender populations regardless of their sociodemographic characteristics or self-perceived risk. For those who refuse, providers should explore the main reasons for the refusal and help in addressing them. Finally, structural interventions are needed to address stigma and discrimination and the sociodemographic disparities in HIV testing among transgender populations.

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Authors' Contributions

B.O.O. and J.R.P. conceptualized the study. B.O.O. and D.A.A. analyzed the data. B.O.O., J.R.P., D.A.A., and D.F.C. prepared the first draft of the manuscript. All authors read and approved the final manuscript.

Author Disclosure Statement

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References

1. Branson BM, Semaan S. HIV screening in health care settings in the United States. Virtual Mentor. 2009;11:974–979.
2. Branson BM, Handsfield HH, Lampe MA, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. MMWR Recomm Rep. 2006;55:1–17.
3. Moyer VA, US Preventive Services Task Force. Screening for HIV: U.S. Preventive Services Task Force recommendation statement. Ann Intern Med. 2013;159:51–60.
4. Owens DK, Davidson KW, Krist AH, et al. Screening for HIV infection: US Preventive Services Task Force Recommendation Statement. JAMA. 2019; 321:2326–2336.
5. Hall HI, Song R, Tang T, et al. HIV Trends in the United States: diagnoses and estimated Incidence. JMIR Public Health Surveill. 2017;3:e8.
6. Patel D, Johnson CH, Krueger A, et al. Trends in HIV testing among US adults, aged 18–64 Years, 2011–2017. AIDS Behav. 2020;24:532–539.

7. Centers for Disease Control and Prevention. Estimated HIV incidence and prevalence in the United States, 2010–2016: HIV surveillance supplemental report. 2019. Available at: https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf. Accessed May 13, 2020.
8. Baral SD, Poteat T, Strömdahl S, et al. Worldwide burden of HIV in transgender women: a systematic review and meta-analysis. Lancet Infect Dis. 2013;13:214–222.
9. Feldman J, Romine RS, Bockting WO. HIV risk behaviors in the U.S. transgender population: prevalence and predictors in a large internet sample. J Homosex. 2014;61:1558–1588.
10. James SE, Herman JL, Rankin S, et al. The Report of the 2015 U.S. Transgender Survey. Washington, DC: National Center for Transgender Equality, 2016.
11. De Santis JP. HIV infection risk factors among male-to-female transgender persons: a review of the literature. J Assoc Nurses AIDS Care. 2009;20:362–372.
12. Reback CJ, Fletcher JB. HIV prevalence, substance use, and sexual risk behaviors among transgender women recruited through outreach. AIDS Behav. 2014;18:1359–1367.
13. Poteat T, Reisner SL, Radix A. HIV epidemics among transgender women. Curr Opin HIV AIDS. 2014;9:168–173.
14. Herbst JH, Jacobs ED, Finlayson TJ, et al. Estimating HIV prevalence and risk behaviors of transgender persons in the United States: a systematic review. AIDS Behav. 2008;12:1–17.
15. Johns MM, Lowry R, Andrzejewski J, et al. Transgender identity and experiences of violence victimization, substance use, suicide risk, and sexual risk behaviors among high school students—19 states and large urban school districts, 2017. MMWR Morb Mortal Wkly Rep. 2019;68:67–71.
16. Becasen JS, Denard CL, Mullins MM, et al. Estimating the prevalence of HIV and sexual behaviors among the US transgender population: a systematic review and meta-analysis, 2006–2017. Am J Public Health. 2019;109:E1–E8.
17. Clark H, Babu AS, Wiewel EW, et al. Diagnosed HIV infection in transgender adults and adolescents: results from the National HIV Surveillance System, 2009–2014. AIDS Behav. 2017;21:2774–2783.
18. Green N, Hoenigl M, Morris S, Little SJ. Risk behavior and sexually transmitted infections among transgender women and men undergoing community-based screening for acute and early HIV Infection in San Diego. Medicine (Baltimore). 2015;94:e1830.
19. Pitasi MA, Oraka E, Clark H, et al. HIV testing among transgender women and men—27 states and Guam, 2014–2015. MMWR Morb Mortal Wkly Rep. 2017;66:883–887.
20. Schwarcz S, Richards TA, Frank H, et al. Identifying barriers to HIV testing: personal and contextual factors associated with late HIV testing. AIDS Care. 2011;23:892–900.
21. Inungu JN. Potential barriers to seeking human immunodeficiency virus testing among adults in the United States: data from the 1998 National Health Interview Survey. AIDS Patient Care STDS. 2002;16:293–299.
22. Zheng MY, Suneja A, Chou AL, Arya M. Physician barriers to successful implementation of US preventive services task force routine HIV testing recommendations. J Int Assoc Provid AIDS Care. 2014;13:200–205.
23. Mimiaga MJ, Reisner SL, Bland S, et al. Health system and personal barriers resulting in decreased utilization of HIV and STD testing services among at-risk black men who have sex with men in Massachusetts. AIDS Patient Care STDS. 2009;23:825–835.
24. MacKellar DA, Hou SI, Whalen CC, et al. Reasons for not HIV testing, testing intentions, and potential use of an over-the-counter rapid HIV test in an internet sample of men who have sex with men who have never tested for HIV. Sex Transm Dis. 2011;38:419–428.
25. Adebayo OW, Gonzalez-Guarda RM. Factors associated with HIV testing in youth in the United States: an integrative review. J Assoc Nurses AIDS Care. 2017;28:342–362.
26. Febo-Vazquez I, Copen CE, Daugherty J. Main reasons for never testing for HIV among women and men aged 15–44 in the United States, 2011–2015. Natl Health Stat Report. 2018;107:1–11.
27. Conserve DF, Oraka E, Abara WE, et al. Correlates of never testing for hiv among non-Hispanic black men in the United States: National Survey of Family Growth, 2011–2013. AIDS Behav. 2017;21:492–500.
28. Joseph HA, Belcher L, O'donnell L, et al. HIV testing among sexually active Hispanic/Latino MSM in Miami-Dade County and New York City: opportunities for increasing acceptance and frequency of testing. Health Promot Pract. 2014;15:867–880.
29. Chadwick JJ, Andrade LF, Altice FL, Petry NM. Correlates of having never been HIV tested among entrants to substance abuse treatment clinics: empiric findings from real-World New England Settings. J Psychoactive Drugs. 2014;46:208–214.
30. Nelson KM, Pantalone DW, Gamarel KE, et al. Correlates of never testing for HIV among sexually active internet-recruited gay, bisexual, and other men who have sex with men in the United States. AIDS Patient Care STDS. 2018;32:9–15.
31. Margolis AD, Joseph H, Belcher L, et al. "Never testing for HIV" among men who have sex with men recruited from a sexual networking website, United States. AIDS Behav. 2012;16:23–29.
32. Sharma A, Kahle E, Todd K, et al. Variations in testing for HIV and other sexually transmitted infections across gender identity among transgender youth. Transgend Health. 2019;4:46–57.
33. Jones J, Carter B, Wilkerson R, Kramer C. Attitudes toward HIV testing, awareness of HIV campaigns, and using social networking sites to deliver HIV testing messages in the age of social media: a qualitative study of young black men. Health Educ Res. 2019;34:15–26.
34. Bond KT, Frye V, Taylor R, et al. Knowing is not enough: a qualitative report on HIV testing among heterosexual African-American men. AIDS Care. 2015;27:182–188.
35. Kellerman SE, Lehman JS, Lansky A, et al. HIV testing within at-risk populations in the United States and the reasons for seeking or avoiding HIV testing. J Acquir Immune Defic Syndr. 2002;31:202–210.
36. Weis KE, Liese AD, Hussey J, et al. A routine HIV screening program in a South Carolina community health center in an area of low HIV prevalence. AIDS Patient Care STDS. 2009;23:251–258.
37. Ferrer RA, Klein WMP. Risk perceptions and health behavior. Curr Opin Psychol. 2015;5:85–89.
38. Todd K, Peitzmeier SM, Kattari SK, et al. Demographic and behavioral profiles of nonbinary and binary transgender youth. Transgend Health. 2019;4:254–261.
39. Smalley KB, Warren JC, Barefoot KN. Differences in health risk behaviors across understudied LGBT subgroups. Health Psychol. 2016;35:103–114.
40. Sewell WC, Blankenship SA. Perceived HIV risk as a predictor of sexual risk behaviors and discrimination among high-risk women. AIDS Care. 2019;31:675–680.
41. Pringle K, Merchant RC, Clark MA. Is self-perceived HIV risk congruent with reported HIV risk among traditionally lower HIV risk and prevalence adult emergency department patients? Implications for HIV testing. AIDS Patient Care STDS. 2013;27:573–584.
42. Nunn A, Zaller N, Cornwall A, et al. Low perceived risk and high HIV prevalence among a predominantly African American population participating in Philadelphia's rapid HIV testing program. AIDS Patient Care STDS. 2011;25:229–235.
43. Sevelius JM, Poteat T, Luhur WE, et al. HIV testing and PrEP Use in a national probability sample of sexually active transgender people in the United States. J Acquir Immune Defic Syndr. 2020;84:437–442.
44. Petroll AE, Mosack KE. Physician awareness of sexual orientation and preventive health recommendations to men who have sex with men. Sex Transm Dis. 2011;38:63–67.
45. Metheny N, Stephenson R. Disclosure of sexual orientation and uptake of HIV testing and hepatitis vaccination for rural men who have sex with men. Ann Fam Med. 2016;14:155–158.
46. Roberts TK, Fantz CR. Barriers to quality health care for the transgender population. Clin Biochem. 2014;47:983–987.
47. Burke RC, Sepkowitz KA, Bernstein KT, et al. Why don't physicians test for HIV? A review of the US literature. AIDS. 2007;21:1617–1624.
48. White BL, Walsh J, Rayasam S, et al. What makes me screen for HIV? Perceived barriers and facilitators to conducting recommended routine HIV testing among primary care physicians in the southeastern United States. J Int Assoc Provid AIDS Care. 2015;14:127–135.
49. Kattari SK, Bakko M, Hecht HK, Kattari L. Correlations between healthcare provider interactions and mental health among transgender and nonbinary adults. SSM Popul Health. 2020;10:100525.
50. Kattari SK, Bakko M, Hecht HK, Kinney MK. Intersecting experiences of healthcare denials among transgender and nonbinary patients. Am J Prev Med. 2020;58:506–513.

51. Centers for Disease Control and Prevention. HIV testing in nonclinical settings. 2019. Available at: https://www.cdc.gov/hiv/testing/nonclinical/index.html. Accessed April 30, 2020.
52. Centers for Disease Control and Prevention. HIV self-testing. 2020. Available at: https://www.cdc.gov/hiv/testing/self-testing.html. Accessed May 24, 2020.
53. Herek GM, Capitanio JP, Widaman KF. HIV-related stigma and knowledge in the United States: prevalence and trends, 1991–1999. Am J Public Health. 2002;92:371–377.
54. Pitasi MA, Chavez PR, DiNenno EA, et al. Stigmatizing attitudes toward people living with hiv among adults and adolescents in the United States. AIDS Behav. 2018;22:3887–3891.
55. Levy ME, Wilton L, Phillips G, et al. Understanding structural barriers to accessing HIV testing and prevention services among black men who have sex with men (BMSM) in the United States. AIDS Behav. 2014;18:972–996.
56. Golub SA, Gamarel KE. The impact of anticipated HIV stigma on delays in HIV testing behaviors: findings from a community-based sample of men who have sex with men and transgender women in New York City. AIDS Patient Care STDS. 2013;27:621–627.
57. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. Psychol Bull. 2003;129:674–697.
58. Turan JM, Elafros MA, Logie CH, et al. Challenges and opportunities in examining and addressing intersectional stigma and health. BMC Med. 2019;17:7.
59. Earnshaw VA, Chaudoir SR. From conceptualizing to measuring HIV stigma: a review of HIV stigma mechanism measures. AIDS Behav. 2009;13:1160–1177.
60. Davidson S, Halsall J. Gender inequality: nonbinary transgender people in the workplace. Cogent Soc Sci. 2016;2:1236511.
61. Dailey AF, Hoots BE, Hall HI, et al. Vital signs: human immunodeficiency virus testing and diagnosis delays—United States. MMWR Morb Mortal Wkly Rep. 2017;66:1300–1306.
62. Cooley LA, Wejnert C, Spiller MW, et al. Low HIV testing among persons who inject drugs—National HIV Behavioral Surveillance, 20 U.S. cities, 2012. Drug Alcohol Depend. 2016;165:270–274.
63. McLenon J, Rogers MAM. The fear of needles: a systematic review and meta-analysis. J Adv Nurs. 2019;75:30–42.
64. McMurtry CM, Noel M, Taddio A, et al. Interventions for individuals with high levels of needle fear: systematic review of randomized controlled trials and quasi-randomized controlled trials. Clin J Pain. 2015;31:S109–S123.
65. Bauserman RL, Ward MA, Eldred L, Swetz A. Increasing voluntary HIV testing by offering oral tests in incarcerated populations. Am J Public Health. 2001;91:1226–1229.
66. Lippman SA, Moran L, Sevelius J, et al. Acceptability and feasibility of HIV self-testing among transgender women in San Francisco: a mixed methods pilot study. AIDS Behav. 2016;20:928–938.
67. Lentz C, Iribarren S, Giguere R, et al. Broaching the topic of HIV self-testing with potential sexual partners among men and transgender women who have sex with men in New York and Puerto Rico. AIDS Behav. 2020;24:3033–3043
68. Carballo-Diéguez A, Giguere R, Balán IC, et al. Use of Rapid HIV self-test to screen potential sexual partners: results of the ISUM Study. AIDS Behav. 2019;24:1929–1941.
69. Hughto JMW, Reisner SL, Mimiaga MJ. Characteristics of transgender residents of Massachusetts cities with high HIV prevalence. Am J Public Health. 2015;105:e14–e18.
70. Raymond HF, Chen YH, Syme SL, et al. The role of individual and neighborhood factors: HIV acquisition risk among high-risk populations in San Francisco. AIDS Behav. 2014;18:346–356.
71. Seelman KL, Young SR, Tesene M, et al. A comparison of health disparities among transgender adults in Colorado (USA) by race and income. Int J Transgend. 2017;18:199–214.
72. Klein PW, Psihopaidas D, Xavier J, Cohen SM. HIV-related outcome disparities between transgender women living with HIV and cisgender people living with HIV served by the Health Resources and Services Administration's Ryan White HIV/AIDS Program: a retrospective study. PLOS Med. 2020;17:e1003125.

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Abbreviations Used

AFAB = assigned female at birth
AMAB = assigned male at birth
aOR = adjusted odds ratio
BRFSS = Behavioral Risk Factor Surveillance System
CDC = Centers for Disease Control and Prevention
CI = confidence interval
GQ/NB = genderqueer/nonbinary
MSM = men who have sex with men
PWID = people who inject drugs
USTS = U.S. Transgender Survey